I-90: Four Lakes to Stateline Operations Study

Screening Process for Potential I-90 Corridor Strategies

First Level Screening

Narrow original toolbox to 11 strategies

Screening Criteria
I-90 Corridor Goals

Strategy	Description	How well does the strategy meet each goal? 1	2	3	Recommend Strategy for Further Screening?
Traffic Operations and Management Strategies					
Active Traffic Management (ATM)	Install devices to create an active traffic management segment that uses a combination of operational strategies that work to fully optimize the existing infrastructure. On I-90 the key ATM strategies include: variable speed system, queue warning system, and dynamic lane control.	●	●	●	YES
Road Weather Information System Station	Add road weather information system (RWIS) stations along the corridor to relay real-time weather and pavement conditions to travelers.	○	◓	○	YES – include with ATM
Ice Warning Signs	Place activated warning signs in key locations that warn travelers when icy roadway conditions are present.	○	◓	○	YES – include with ATM
Ramp Metering	Install traffic signals on freeway ramp meters that alternate between red and green signals to control the flow of vehicles entering the freeway. Metering rates can be altered based on freeway and on-ramp traffic conditions.	●	●	◓	YES
Ramp Closures (Permanent or Time of Day)	Close an on or off ramp at an interchange to achieve standard interchange spacing and reduce congestion and collisions resulting from substandard interchange spacing.	●	◒	◓	YES
Integrated Corridor Management	With integrated corridor management, the various institutional partner agencies manage the transportation corridor as a system, rather than the more traditional approach of managing individual assets. Travelers could dynamically shift to alternative transportation options, even during a trip, in response to changing traffic conditions.	◓	●	○	YES
Real-Time Traveler Information	Explore options to improve real-time information for travelers including: dynamic message signs (DMS), onboard GPS devices, and 3rd party apps such as Inrix, HERE or WAZE.	◓	○	●	YES
Wrong Way Driver Notification System	Install a wrong way driver alert system on off-ramps that can detect wrong way drivers, activate signs to help deter the wrong way driver, and send a notification to the TMC so operators can monitor the car's movement using cameras and send messages to VMS or drivers with on-board systems.	◒	○	○	YES
Red Light Running Cameras	Install cameras at select intersections that can automatically detect when a vehicle runs a red light, take a picture, and issue a ticket.	○	◓	◓	Not at this time
Connected Vehicle Strategy	Implement technologies that relay real-time information from ITS infrastructure to connected vehicles.	○	○	○	Not at this time
Dynamic Curve Speed Warning Signs	Install dynamic feedback signs that measure the speed of individual vehicles and display activated messages if motorist speed is over a designated threshold.	○	◓	○	Not at this time
Traffic Surveillance	Add cameras along I-90 to improve traffic monitoring capabilities, and connect to the traffic management center (TMC). This strategy could be used in conjunction with providing real time information for both traveler information and incident management.	◓	◒	◒	YES – include with ATM
Off-Ramp Traffic Signal Coordination	Improve signal timing at select off-ramps and surrounding traffic signals to prevent vehicle queues from extending onto the freeway mainline.	○	○	◓	Ongoing
Maintenance and Construction Management Strategies					
Work Zone Management	Address work zone policies and management for both daily (temporary) maintenance activities and longer term construction activities to improve the safety of both the workers and travelers. Strategies include: speed control, use of portable VMS, coordination with law enforcement, communicating delays, detours, and lane configuration changes to travelers.	◒	●	○	YES
Telematics Technology on Fleet Vehicles	Add telematics capabilities on fleet vehicles that can be used to track vehicle performance, vehicle maintenance, and vehicle activities in real-time.	◓	◒	○	YES
Asset Management Software	Install software that enables automated maintenance logs and proactive management of system health (notifications of equipment failure) for ITS infrastructure.	◓	◒	◓	Ongoing – some capabilities included with new ATMS software
Corridor Operations Team	Implement a corridor operations team that coordinates between all agencies that operate roadway facilities or transit along the I-90 corridor.	◓	◒	◓	Not at this time
Transportation Management Center Enhancements	The purpose of a Transportation Management Center is to integrate various departments and offices of transportation and emergency agencies into a unified communications center.	◓	◒	◓	Not at this time
Emergency and Incident Management Strategies					
Traffic Incident Management Strategies	Pursue TIM strategies that include: TIM team development, expanding the Dedicated Roving Patrol program, and establishing instant tow contracts.	◒	●	○	YES
Traffic Incident Management Strategic Plan	Develop a region-specific traffic incident management strategic plan that prioritizes future projects and investments related to traffic incident management. The plan can also help formalize relationships and agreements between responders and agencies.	◓	◒	◓	Not at this time
9-1-1 Dispatch Integration	Connect the 9-1-1 dispatch center with SRTMC. Currently when a call comes into the 9-1-1 dispatch center that effects a state highway, WSP manually calls the TMC to relay the issue. Connecting SRTMC directly to the 9-1-1 dispatch center allows for the transportation agencies to be automatically notified when an event on a state facility occurs. Currently WSDOT has view-only access to events on the WSP computer aided dispatch screen, with some information scrubbed.	◓	●	○	YES
Hourly Towing Contract	Initiate an hourly towing contract between WSDOT and towing companies during bad weather conditions or other necessary events. This contract enables WSDOT to dictate towing priorities and allocated towing resources as necessary.	◓	◒	◓	Not at this time
Sharing On-Scene Photos and Video	Invest in technology that allows first responders to send and receive photos and video from an incident scene, including the tow partners.	○	○	◓	Not at this time
Interoperable Communication Procedures	Implement standard protocols for using radios between agencies. This strategy could be a task for the TIM Team to develop.	○	◒	◓	Not at this time
Event Management	Event transportation management systems can help control the impact of congestion at stadiums, convention centers, fairgrounds, or other facilities that generate high traffic volumes for planned events.	◓	○	○	Not at this time
Situational Software	Integrate Situational Awareness software during incident or emergency response. The software can track where each of the response agencies/vehicles is (en route, at the scene, and during clean up) and improve communication between responders.	◓	◒	◓	Not at this time
Transit and Demand Management Strategies					
Real-Time Transit Information	Provide real-time transit information to transit riders including: vehicle location, estimated arrival time, trip duration, and possibly percent occupancy.	●	○	●	Not at this time
Demand Management Strategies	Promote travel that reduces overall demand on the system such as: bus transit, carpool, and non-peak hour commuting.	◓	○	○	Not at this time
Active Demand Management Strategies	Active demand management strategies include using real-time information to dynamically adjust user demand. Strategies include dynamic pricing, on-demand transit, and dynamic ridesharing.	◓	○	○	Not at this time
Infrastructure Management Strategies					
Targeted Roadway Improvements	Construct targeted roadway improvements to meet current standards for acceleration and merge areas.	◒	○	●	YES
Targeted Shoulder Widening - Auxiliary Lane	Construct shoulder (right or left) to provide an extra travel lane during high demand or high congestion.	○	○	●	Not at this time

Goal 1

Improve safety performance for all I-90 corridor users

Objectives

- Meet Washington State Safety Plan Target Zero goals of zero traffic fatalities and serious injuries by 2030.
- Reduce weather-related crashes.
- Reduce rear-end crashes.
- Reduce pedestrian and bicycle crashes at ramp terminals.

Goal 2

Enable efficient management and operations of the I-90 Corridor

Objectives

- Improve clearance times for all lane-blocking incidents.
- Improve construction and maintenance work zone management policy.
- Improve coordination between agencies and districts that maintain, operate or respond to incidents or planned events along the facility.
- Improve travel time reliability along the corridor.

Goal 3

Enhance traveler information along the I-90 Corridor

Objectives

- Communicate real-time road conditions to travelers using any mode (passenger vehicle, freight, or transit).
- Enhance available pre-trip and en-route traveler information.
- Provide information about planned events or work zones that impact travel at least 24 hours prior to the occurrence.

Second Level Screening

Narrow to 6 strategies

Screening Criteria
Operational Benefits
Feasibility
Initial Cost
Ongoing O&M costs

Strategy	First Level Screening: 1: Safety	2: Efficiency	3: Traveler Info	Second Level Screening: Operational Benefits	Influencing Factors	Implementation Cost	Ongoing O&M Cost	Recommend Strategy for Further Screening?
Traffic Operations and Management Strategies								
Active Traffic Management (ATM) – variable speeds, queue warning, dynamic lane control, off-ramp signal coordination	●	●	●	●	○	◓	◓	YES
Ramp Metering	●	●	◓	●	◒	◒	◒	YES
Ramp Closures (Permanent or Time of Day)	●	◒	◓	●	◒	◒	●	YES
Integrated Corridor Management	◒	●	○	◒	◒	◒	◒	Not at this time
Expand Real-Time Traveler Information	◒	○	●	○	◒	○	○	Ongoing
Wrong Way Driver Notification System	◒	○	○	◒	●	◒	○	YES
Maintenance and Construction Management Strategies								
Work Zone Management	◒	●	○	◒	●	○	◓	YES
Telematics Technology on Fleet Vehicles	◒	◒	○	◓	◒	◒	◒	Not at this time
Emergency and Incident Management Strategies								
Traffic Incident Management Strategies – TIM Team Development, Expand Roving Patrol, and Establish Instant Tow Contracts	◒	●	○	●	●	◒	◓	YES
9-1-1 Dispatch Integration	◒	●	○	○	○	○	◒	Not at this time
Transit and Demand Management Strategies								
Real-Time Transit Information	--	--	--	--	--	--	--	--
Infrastructure Management Strategies								
Targeted Roadway Improvements – Weave and Merge Areas	◒	○	◓	●	◒	◓	●	Not at this time

Notes:
A – Four influencing factors: physical, institutional, and operations and maintenance
B – The high implementation cost for ATM represents a system wide installation. Smaller segments could be implemented for a lower cost.

Icon	Meaning
●	**Best achieves the project goal**
◒	**Mostly achieves project goal**
○	**Achieves some of the project goal**
◓	**Achieves little of the project goal**
◓	**Does not achieve the project goal**

Implementation Plan

Advance recommended strategies to the Implementation Plan

TOP SIX TSMO STRATEGIES

Active Traffic Management
Install variable message signs (VMS) and weather sensors along the freeway to provide variable speeds notifications, queue warnings, and dynamic lane control.

Ramp Metering
Install ramp meters at on-ramps to manage the flow of entering vehicles, reduce crashes at merge areas, and minimize congestion on the mainline.

Ramp Closures
Evaluate the potential benefits of closing ramps including crash reduction and minimizing congestion. Note – the socio-economic and political factors will be fully examined by WSDOT outside the scope of this project.

Wrong Way Driver Notification System
Install sensors on off-ramps that can detect wrong-way drivers and alert the traffic management center and travelers using VMS or, when possible, on-board navigation systems.

Traffic Incident Management (TIM) Strategies
Enhance existing traffic incident management strategies by: further developing TIM Teams, expanding the Incident Response, and establishing instant tow contracts.

Work Zone Management
Implement work zone management strategies that improve safety in work zones. These strategies apply safety measures that inform drivers of work zone and worker locations, limit work zone hours, and support a range of work zone durations from long-term stationary projects to short duration or even mobile projects.